



## PATENT ABSTRACTS OF JAPAN

(11) Publication number: **07161703 A**(43) Date of publication of application: **23.06.95**

(51) Int. Cl. **H01L 21/31**  
**C23C 16/50**  
**C23F 4/00**  
**H01L 21/768**

(21) Application number: **05339565**(71) Applicant: **RICOH CO LTD**(22) Date of filing: **03.12.93**(72) Inventor: **FUSE AKIHIRO**

(54) MANUFACTURE OF SEMICONDUCTOR DEVICE

COPYRIGHT: (C)1995,JPO

(エッチング+エッチング) プロセス

エッチングプロセス

(57) Abstract:

PURPOSE: To restrain damage on a semiconductor device by a bias ECR plasma CVD method, and form a high reliability insulating film with excellent controllability which has an excellent step-covering form.

CONSTITUTION: Firstly a bias ECR plasma CVD process is performed for a specified period by introducing film forming material gas and argon gas, and a silicon oxide film 3 having an overhang form to some extent is formed on a metal wiring 2 as shown by (A). Secondly the introduction of film forming gas is interrupted, and a sputter etching process is performed for a specified period. By primarily etching the overhang part of the silicon oxide film 3, a form shown by (B) is obtained. After that, the bias ECR plasma CVD process and the sputter etching are sequentially repeated, and an insulating film 3 having excellent step-covering form wherein the part between the metal wirings 2 and 2 is filled without voids and flattened as shown by (H) is finally formed.

